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IS 3231-1-2 (1986): Electrical relays for power system protection, Part 1: General requirements, Section 2: Insulation tests [ETD 35: Power Systems Relays]



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# *Indian Standard*

## SPECIFICATION FOR ELECTRICAL RELAYS FOR POWER SYSTEM PROTECTION

### PART 1 GENERAL REQUIREMENTS

#### Section 2 Insulation Tests

#### *( First Revision )*

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**BUREAU OF INDIAN STANDARDS**  
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG  
NEW DELHI 110002

*Indian Standard*SPECIFICATION FOR  
ELECTRICAL RELAYS FOR  
POWER SYSTEM PROTECTION

## PART 1 GENERAL REQUIREMENTS

## Section 2 Insulation Tests

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# *Indian Standard*

## SPECIFICATION FOR ELECTRICAL RELAYS FOR POWER SYSTEM PROTECTION

### PART 1 GENERAL REQUIREMENTS

#### Section 2 Insulation Tests

### *( First Revision )*

## 0. FOREWORD

**0.1** This Indian Standard ( Part 1/Sec 2 ) ( First Revision ) was adopted by the Indian Standards Institution on 26 November 1986, after the draft finalized by the Relays Sectional Committee had been approved by the Electrotechnical Division Council.

**0.2** This standard was first published in 1965. This revision takes into account the experience gained since then and it has been aligned with the international practices to the extent found appropriate. This part/section is one of the new revised series, general introduction to which is given in IS : 3231 ( Part 0 )-1986\*.

The standards published in the revised series so far are:

IS : 3231 Specification for electrical relays for power system protection:

- |                       |   |
|-----------------------|---|
| ( Part 0 )-1986       | General introduction and list of parts<br>( <i>first revision</i> )   |
| ( Part 1/Sec 1 )-1986 | General requirements, Section 1 Contact performance ( <i>first revision</i> )                               |
| ( Part 1/Sec 2 )-1986 | General requirements, Section 2 Insulation tests ( <i>first revision</i> )                                  |
| ( Part 1/Sec 3 )-1986 | General requirements, Section 3 High frequency disturbance test for static relays ( <i>first revision</i> ) |
| ( Part 2/Sec 1 )-1987 | Requirements for principal families, Section 1 All-or-nothing relays  |

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\*Specification for electrical relays for power system protection: Part 0 General introduction and list of parts ( *first revision* ).

## **IS : 3231 ( Part 1/Sec 2 ) - 1986**

- ( Part 2/Sec 2 )-1987 Requirements for principal families, Section 2 General requirements for measuring relays
- ( Part 3/Sec 1 )-1987 Requirements for particular group of relays, Section 1 Non-specified time or independent specified time measuring relays
- ( Part 3/Sec 2 )-1987 Requirement for particular group of relays, Section 2 Dependent specified time measuring relays
- ( Part 3/Sec 3 )-1987 Requirement for particular group of relays, Section 3 Biased percentage differential relays

**0.3** This standard is to be read in conjunction with IS : 12083 ( Part 2 )-1986\* to which it makes the reference and supplements where the special requirements for protection relays make this necessary.

**0.4** According to the classification on hierarchical basis [ see IS : 3231 ( Part 0 )-1986† ] this standard is a first level document.

**0.5** In preparing this standard, assistance has been drawn from BS 142 : Section 1.3 : 1982 'Electrical protection relays, Part 1 Information and requirements for all protective relays, Section 1.3 Specification for insulation testing'. British Standards Institution.

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### **1. SCOPE**

**1.1** This standard ( Part 1/Sec 2 ) specifies methods and general requirements for insulation tests as applicable to electrical protection relays.

### **2. TERMINOLOGY**

**2.1** For the purpose of this standard, the definitions given in IS : 1885 ( Part 9 )-1986‡ and IS : 12083 ( Part 2 )-1986\* shall apply.

### **3. ASSESSMENT OF RATED INSULATION VOLTAGES**

**3.1** The requirements of 3 of IS : 12083 ( Part 2 )-1986\* shall apply with the additional provision that for protection relays, the value of the rated insulation voltage shall correspond to the test voltage specified in 5.2 of this standard.

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\*Specification for electrical relays: Part 2 Insulation tests.

†Specification for electrical relays for power system protection: Part 0 General introduction and list of parts (*first revision*).

‡Specification for electrotechnical vocabulary: Part 9 (Electrical relays (*first revision*)).



## **4. GENERAL REQUIREMENTS REGARDING INSULATION TESTS**

**4.1** The requirements of 4 of IS : 12083 ( Part 2 )-1986\* shall apply.

## **5. DIELECTRIC TESTS**

**5.1** The requirements of 5 of IS : 12083 ( Part 2 )-1986\* shall apply with the addition of supplementary requirements specified in 5.2 and 5.3 of this standard.

### **5.2 Value of the Test Voltage**

**5.2.1 General** — Relays for use on rated insulation voltage 60 V and above and other than those intended for connection to pilot cables shall withstand a dielectric test voltage of 2 kV rms in accordance with test method specified in 5 of IS : 12083 ( Part 2 )-1986\*.

Relays used on voltages less than 60 V shall withstand a dielectric test voltage of 500 V rms applied in accordance with 5 of IS : 12083 ( Part 2 )-1986\*.

Normally open output contacts of all relays except for relays used on voltage less than 60 V shall withstand a dielectric test voltage of 1 kV rms.

**5.2.2 Relays Connected to Pilot Cables** — Relays intended for connection to private pilot cables shall withstand a dielectric test voltage of either 5 kV rms or 15 kV rms. The value to be used depends upon the specific application and shall be specified by the purchaser at the time of ordering.

### **5.3 Test Methods**

**5.3.1 General** — The manner of application of the test voltage shall be in accordance with 5.4 of IS : 12083 ( Part 2 )-1986\*.

**5.3.2 Relays Connected to Pilot Cables** — The dielectric test voltage specified in 5.2.2 shall be applied between the pilot circuit terminals and all other terminals and the case connected together in the manner specified in 5.4 of IS : 12083 ( Part 2 )-1986\*. For all other terminals and circuits, the test voltage and its application shall be as specified in 5.2.1 of this standard.

## **6. MEASUREMENT OF INSULATION RESISTANCE**

**6.1** The requirements of insulation resistance are not applicable to protection relays.

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\*Specification for electrical relays: Part 2 Insulation tests.

**7. IMPULSE VOLTAGE TESTS**

**7.1** The requirements of 7 of IS : 12083 ( Part 2 )-1986\* shall apply.

**8. MARKING**

**8.1** The requirements of 8 of IS : 12083 ( Part 2 )-1986\* shall apply.

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\*Specification for electrical relays: Part 2 Insulation tests.

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